

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
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Draft Staff Report For

Proposed Rule 1143 – Consumer Paint Thinners and Multi-Purpose Solvents

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TABLE OF CONTENTS

	Page
I. Executive Summary	1
II. Background	2
III. Technology Review	5
IV. Legislative Authority	7
V. Rule Proposal	8
VI. Emissions Inventory	9
VII. Emission Reductions – Current Inventory	10
VIII. Cost Analysis	12
IX. Incremental Cost-Effectiveness	14
X. California Environmental Quality Act (CEQA)	15
XI. Socioeconomic Assessment	16
XII. Comparative Analysis	16
XIII. Draft Findings	16
XIV. Draft Conclusions and Recommendations	17
XV. Public Comments and Responses	17
XVI. References	28
Appendix A: Background - Solvents	
Appendix B: Compliant Technology Currently Available	
Appendix C: TDS & MSDS References	

LIST OF TABLES

	Page
Table 1. Partial List of Solvent Manufacturers	3
Table 2. Various Solvents Commonly Found At Hardware Stores	4
Table 3. NFPA Health and Flammability Ratings	5
Table 4. Low-VOC Products Currently Available	7
Graph 1. Consumer Products Versus Many Other Categories For VOC Emissions - 2014	10
Table 5. Breakdown of Available CES Sources	11
Table 6. Comparison of VOC Limit Reductions and Costs	15

ACRONYMS USED

AIM	Architectural/Industrial Maintenance Coatings
ASTM	American Standard Test Method
AQMD	South Coast Air Quality Management District
Basin	South Coast Air Basin
CARB	California Air Resources Board
CAS	Clean Air Solvent
CES	Category of Emission Sources
CEQA	California Environmental Quality Act
ID (Number)	Identification (Number)
MEK	Methyl Ethyl Ketone
MSDS	Material Safety Data Sheet
NFPA	National Fire Protection Association
NPCA	National Paint and Coating Association
PCBTF	ParaChloroBenzoTriFluoride
PM _{2.5}	Particulate Matter of 2.5 Microns
PPM	Parts Per Million
PR	Proposed Rule
SEA	Subsequent Environmental Assessment
SIP	State Implementation Plan
TBAc	Tertiary Butyl Acetate
TPD	Tons per Day
U.S. EPA	United States Environmental Protection Agency
VM & P	Varnish Makers & Printers (Naphtha)
VOC	Volatile Organic Compound

I. EXECUTIVE SUMMARY

Consumer paint thinners and multi-purpose solvents is currently an unregulated category of consumer products, typically regulated by the California Air Resources Board (CARB). After an initial proposal to limit the VOC content for consumer paint thinners and multi-purpose solvents to 3% by weight, CARB staff elected to remove this category from their current rulemaking and delay it for future consideration.

The 2007 Air Quality Management Plan (AQMP) highlights the growing impact of VOC emissions from consumer products, the largest single source of VOC emissions in the South Coast Air Basin. Control Measure CTS-04 - Emission Reductions from the Reduction of VOC Content of Consumer Products Not Regulated by the State Board, calls for further emission reductions from consumer paint thinners and multi-purpose solvents not regulated by CARB. Control Measure CTS-04 relies on carryover technology from Rule 1171 and seeks to transfer readily available low- and zero- VOC technology currently in use by stationary sources to the consumer market. If approved, Proposed Rule 1143 – Consumer Paint Thinners and Multi-Purpose Solvents (PR 1143) would fully implement Control Measure CTS-04 from the 2007 AQMP

Key elements of PR1143 include the following:

- Establish a material VOC limit of 25 g/l for consumer paint thinners and multi-purpose solvents, effective January 1, 2010.
- Prohibit the sale and solicitation of non-compliant consumer paint thinners and multi-purpose solvents
- Require distributors and manufacturers of consumer paint thinners and multi-purpose solvents to obtain a distributor or manufacturer's ID#, respectively, by July 1, 2009.
- Require point-of-sale containers to display VOC content as supplied and for recommended dilution, date of manufacture, and registration confirmation.
- Establish exemptions for products sold in the District for shipment outside the District, products used for thinning industrial maintenance coatings and clean-up of some specialty industrial maintenance coatings, as well as products used in analytical, educational, and laboratory uses.
- Sell-through period of one year.

As proposed, the rule would reduce emissions by 9.76 tpd or 95.7% for the consumer paint thinner and multi-purpose solvent universe. The estimated socioeconomic impacts of the proposed amendment will be presented in the Draft Staff Report.

II. BACKGROUND

Consumer Products are the largest source of VOC emissions in the South Coast Air Basin (Basin). CARB estimates that consumer products in the state of California account for approximately 245 tons per day (tpd) of VOC emissions¹. Approximately forty-five percent (45%) of that estimate or 110.3 tpd of VOC emissions² can be attributed to the basin.

The 2007 AQMP highlights the growing impact of VOC emissions from consumer products. Taking into account population growth and planned VOC reductions by CARB, the AQMP estimates that the annual average VOC emissions for the consumer product category will be 107 tpd by the year 2014, and will likely increase to 112.1 tpd by the year 2020³.

California Health and Safety Code section 41712 authorizes CARB to regulate certain consumer products. “Consumer product” is defined as a chemically formulated product used by household and institutional consumers. *See* Cal. Health & Safety Code § 41712(a)(1). Although CARB regulates numerous categories of consumer products, consumer paint thinners and multi-purpose solvents are currently an unregulated category. The AQMD therefore has the authority to regulate this category of consumer products. *See* Cal. Health & Safety Code § 41712(f); *see infra* Section IV. Indeed, Control Measure CTS-04 – Emission Reductions from the Reduction of VOC Content of Consumer Products Not Regulated by the State Board specifically calls for further emission reductions from consumer paint thinners and multi-purpose solvents not regulated by CARB. As such, if approved, PR 1143 would implement Control Measure CTS-04 from the 2007 AQMP.

Consumer paint thinners and multi-purpose solvents work very well for cleaning such deposits as grease, oil, paint, carbon deposits, including other residues from tools, equipment, and general household uses. As mandated by CTS-04, PR 1143 targets products offered for sale and use within the district. Similar to Rule 1113 – Architectural Coatings, PR 1143 would apply to suppliers, distributors and retailers of consumer paint thinners and multi-purpose solvents. PR 1143 would limit the VOC content of products sold to consumers, since solvent cleaning operations conducted as part of a business are already regulated under Rule 1171.

Control Measure CTS-04 – as implemented through PR 1143 – relies on carryover technology from Rule 1171 by transferring readily available low- and zero-VOC technology currently in use by stationary sources to the consumer market. Rule 1171 restricts most cleaning solvents to 25 g/L or less VOC at permitted facilities, as well as some non-permitted facilities. As part of the Rule 1171 implementation, the AQMD developed the Clean Air Solvent (CAS) program to highlight ultra-low VOC technology, as well as provide a marketing tool for the manufacturers of these ultra-low VOC products. In order to qualify for the CAS certification the following criteria must be met:

1. VOC concentration is no more than 25 grams of VOC per liter of material, as applied;

¹ *See* <http://www.arb.ca.gov/consprod/geninfo/cpsmog.htm>

² This estimate does not reflect additional VOC reductions proposed by CARB.

³ *See* Final 2007 Air Quality Management Plan, Chapter 3

2. Composite vapor pressure is no more than 5 mm Hg of VOC at 20°C (68° F);
3. Reactivity is not higher than toluene; and
4. Contains no compounds classified as Hazardous Air Pollutants (HAPs) by the federal Clean Air Act, Ozone-Depleting Compounds (ODCs), or Global Warming Compounds (GWCs).

Many of the solvent technologies certified under the CAS program have utility as consumer paint thinners and multi-purpose solvents. The most common and effective cleaners that meet this criteria are water-based or aqueous cleaners that contain little or no VOCs, although other options such as VOC exempt compounds are also available to the user. Of the 171 certified CAS, staff has found 162 products that could be used in the consumer market. This includes mostly products used as multi-purpose solvents, but also some that can be used to thin waterborne and solvent-based coatings, including a compliant lacquer thinner. Staff continues to assess the CAS list and will update the list with any new findings that are directly applicable to the products covered by this proposed rule.

CURRENT TECHNOLOGY

Several manufacturers of traditional paint thinners and multi-purpose solvents are shown in Table 1. Based on a review of the solvent industry, the largest manufacturer of these products is Brenntag Pacific, a German company that has manufacturing and distribution plants around the world, including the South Coast AQMD. The raw solvents generally come from the petroleum refineries.

TABLE 1: PARTIAL LIST OF SOLVENT MANUFACTURERS

MANUFACTURER	CITY	STATE
Brenntag Pacific	Santa Fe Springs	California, U.S. of A.
W.M. Barr and Company, Inc.	Memphis	Tennessee, U.S. of A.
Citco Petroleum Corp	Rolling Meadows	Illinois, U.S. of A.
SunnySide Corp	Wheeling	Illinois, U.S. of A.
Sterling-Clark-Lurton Corp	Malden	Massachusetts, U.S. of A.
Recochem Inc.	Montreal	Quebec, Canada
Shell Chemicals	Houston	Texas, U.S. of A.
Sunoco, Inc	Philadelphia	Pennsylvania, U.S. of A.
Mid-America Chem Corp.	Cleveland	Ohio, U.S. of A.
Union Carbide	Danbury	Connecticut, U.S. of A.

Multi-purpose solvents are available at a variety of retail outlets, including mass merchants like Lowe's and Home Depot, as well as smaller hardware stores. It is estimated that 1,212,931.5⁴

⁴ Based on 10.2 tpd and using 736 g/L VOC as the sales weighted average

gallons of these high-VOC containing solvents are sold in the AQMD jurisdiction each year. Only one of these popular solvents is exempt as a VOC and that product is commonly known as acetone. Multi-purpose solvents are formulated for various uses from paint thinning to equipment and general clean-up. The most common multi-purpose solvents currently sold are shown in Table 2, and they are sold in quart, gallon and 5-gallon size capacities. A brief explanation of each solvent is included in Appendix A.

TABLE 2: VARIOUS SOLVENTS COMMONLY FOUND AT HARDWARE STORES

SOLVENT	VOC CONTENT	BOILING POINT	FLASH POINT ¹ (TCC)	HEALTH RATING ²	FLAMMABILITY RATING ³	EVAPORATION RATE (Butyl Acetate = 1)
Acetone	Exempt	133.2 °F	4.6 °F	1	3	5.7
Denatured Alcohol	797 g/L	150.8 °F	53.5 °F	1	3	2.3
Isopropyl Alcohol	786 g/L	180.0 °F	53.0 °F	1	3	2.3
Lacquer Thinner	797 g/L	212.6 °F	7.4 °F	2	3	2.7
MEK	807 g/L	175.0 °F	21.8 °F	1	3	4.4
Mineral Spirits	781 g/L	349.9 °F	104.7 °F	1	2	0.1
Paint Thinner	838 g/L	299.6 °F	93.6 °F	2	3	1.4
Toluene	870 g/L	230.8 °F	41.8 °F	2	3	2.0
Turpentine	863 g/L	323.7 °F	94.3 °F	1	3	0.7
VM&P Naphtha	754 g/L	266.9 °F	53.1 °F	1	3	1.2
Xylene	870 g/L	293.2 °F	79.3 °F	2	3	1.4

1 - TCC is the standard Tagliabue Closed Cup

2 - Based on NFPA Rating System

Values in table are from an average of multiple MSDS sheets

There are different methods that can be used to determine the flashpoint of a solvent but the most frequently used method is the Tagliabue Closed Cup standard (ASTM D56), also known as the TCC. The flashpoint is determined by a TCC laboratory device which is used to determine the flash point of mobile petroleum liquids that have a flash point temperature below 175 °F (79.4 °C).

The Health and Flammability ratings are designated by the NFPA and employ a rating system that ranges from 0 to 4 and is shown in Table 3.

**TABLE 3:NFPA HEALTH AND
FLAMMABILITY RATINGS**

RATING	HAZARD
0	Least
1	Slight
2	Moderate
3	High
4	Extreme

III. TECHNOLOGY REVIEW

There are currently three different categories of products that lend themselves to low and zero-VOC formulations. 1.) Aqueous technology is typically used for thinning waterborne coating products, 2.) Exempt solvents include acetone, PCBTF, and methyl acetate, as well as blends of the three, 3.) Bio based technology including methyl esters is currently available for a variety of uses, including lowering the volatility of exempt solvents. The majority of the architectural coating products are now waterborne coatings and the large majority of these do not require any thinning with a solvent, but can be thinned with water. Furthermore, based on the VOC limits in place, manufacturer supplied coatings can be thinned, but typically to a small degree to ensure that the product (as-used) after thinning remains below the applicable VOC limit.

There are several manufacturers, as highlighted in the certified CAS list that have formulated and are marketing products that comply with the proposed limit of 25 g/L by using VOC-exempt compounds. Aqueous formulations and bio-based technology that can replace the higher-VOC products are currently on the market. The following details each of the three technologies. Appendix B contains a comprehensive list of compliant products that are currently available.

AQUEOUS SOLVENTS

There are many aqueous based cleaning solvents and several have been certified for the AQMD's CAS Program. These solvents are regulated under Rule 1171, Solvent Cleaning Operations. Currently, many manufacturers have adapted to waterborne products to meet the VOC limits. Many of these products, especially coatings, do not require thinning, and are typically supplied as ready to be used. There are some waterborne coatings that are thinned, typically with water, under certain climatic conditions, especially when spray-applied.

CURRENTLY EXEMPT SOLVENTS

ACETONE

Acetone is a colorless, highly volatile liquid that has a fragrant, mint-like odor. Acetone is commonly used in nail polish removers and for clean-up. It has a high solvent strength greater than the other types of solvents, except for methyl ethyl ketone (MEK), which has a similar solvent strength. Acetone is widely available at retail stores that sell solvents.

As a VOC - Acetone is currently listed as an exempt solvent pursuant to Rule 102, Group I. Acetone was originally “delisted” as a VOC by USEPA in 1995.

Flammability – Acetone has a NFPA rating of 3 for flammability indicating that it is a highly flammable solvent.

Toxicology - Acetone has a NFPA rating of 1 which indicates that it has a slight health risk. It is also produced in the human body, albeit in small amounts. Acetone can be harmful if inhaled, ingested or absorbed through the skin and can be fatal in large quantities.

PARACHLOROBENZOTRIFLUORIDE (PCBTF)

Parachlorobenzotrifluoride is a colorless liquid with a distinct aromatic odor and is commonly referred to as PCBTF. It is commonly used in the printing industry to dissolve ink, but is also used as a cleaning solvent in other industries. Oxsol 200 and Oxsol 300 are used in the automotive industry for parts washing as a compliant and suitable replacement for Stoddard solvent.

As a VOC - PCBTF is currently listed as an exempt solvent pursuant to Rule 102, Group I.

Flammability – PCBTF has a NFPA rating of 3 for flammability indicating that it is a highly flammable solvent.

Toxicology – PCBTF has a NFPA rating of 1 for health which indicates that it has a slight health risk. The vapors from PCBTF can irritate the nose, throat, skin, and eyes.

METHYL ACETATE

Methyl Acetate is also known as acetic acid methyl ester or methyl ethanoate and is a colorless liquid with a fragrant, fruity odor. Methyl Acetate is commonly used as a solvent in adhesive and nail polish removers.

As a VOC - Methyl Acetate is currently listed as an exempt solvent pursuant to Rule 102, Group I.

Flammability – Methyl Acetate has a NFPA rating of 3 for flammability indicating that it is a highly flammable solvent.

Toxicology – Methyl Acetate has a NFPA rating of 2 for health which indicates that it has a moderate health risk. The vapors from methyl acetate can irritate the nose, throat, skin, and eyes.

BIO-BASED COMPLIANT SOLVENTS

Several manufacturers have already formulated cleaning solvents and thinners using methyl esters such as soy, coconut and rapeseed based formulations. There are several of these currently available products that have been certified by the District as CAS. Methyl esters can be used to thin solvent based coatings because they are miscible in solvent but not in waterborne products. Methyl esters also mix well with acetone and have been used to

formulate blends that can meet a 25 g/L VOC requirement, and also have the additional benefit of lowering the overall volatility.

Staff has found low-VOC paint thinners that already meet the proposed 25 g/L VOC limit for both waterborne and solvent-based coatings sold at several suppliers and these are summarized in the table below.

TABLE 4: LOW-VOC PRODUCTS CURRENTLY AVAILABLE

MANUFACTURER NAME	PRODUCT NAME	VOC _{MATERIAL} (g/L)	CURRENTLY AVAILABLE?
Bortz Distributing	Low-VOC Lacquer Thinner	< 25	Yes
Sunnyside Corporation	Green Envy Paint Thinner	19	Yes
Packaging Services Co., Inc.	Crown Paint Thinner NEXT	0	Yes
RAMCO Specialty Products, Inc.	Soylent Gold Soybased Degreaser	25	Yes
Deft Finishes	VOC Exempt Reducer IS-256	0	Yes
Deft Finishes	VOC Exempt Reducer IS-276	0	Yes
Rust-Oleum Corporation	VOC Compliant Thinner	0	Yes
Carboline Company	Thinner 243 E	0	Yes

Staff has also reviewed technical data sheets for industrial maintenance coatings, especially compliant solvent-based systems and recognizes the need for specific thinners recommended for use with these products. Although some reducers/thinners have VOC levels less than 25 g/L, others do not. Therefore, staff is proposing an exemption for the sale and use of thinners specifically designated as thinners for industrial maintenance coatings. Furthermore, staff has also identified the need for higher-VOC cleaning solvents for highly specialized polyaspartics and polyurea coatings, and therefore has included an exemption for the sale and use of these products.

IV. LEGISLATIVE AUTHORITY

The California Legislature created the AQMD in 1977 (The Lewis-Presley Air Quality Management Act, California Health and Safety Code Section 40400 *et seq.*) as the agency responsible for developing and enforcing air pollution control rules and regulations in the Basin. By statute, the AQMD is required to adopt an AQMP demonstrating compliance with all state and federal ambient air quality standards for the Basin. *See* Cal. Health & Safety Code § 40460(a). Furthermore, the AQMD must adopt rules and regulations that carry out the AQMP. *See* Cal. Health & Safety Code § 40440(a).

As discussed above, Control Measure CTS-04 of the 2007 AQMP specifically calls for

emission reductions from consumer paint thinners and multi-purpose solvents not regulated by CARB. Although California Health and Safety Code section 41712 authorizes CARB to regulate certain consumer products, local air districts retain the authority to adopt VOC standards for any consumer product category for which CARB has not already adopted a standard. *See* Cal. Health & Safety Code § 41712(f). Because CARB has not adopted any rules or regulations that currently address consumer paint thinners and multi-purpose solvents, the AQMD has the authority to regulate this category of consumer products.

V. RULE PROPOSAL

PR 1143 will limit the VOC content of consumer paint thinners and multi-purpose solvents to 25 g/L beginning January 1, 2010. The proposed rule will reduce emissions of VOCs from the use, storage and disposal of these solvent materials that are commonly used in thinning of coatings and the clean-up of coating application equipment and any other solvent cleaning operation. The proposed rule will apply to any person who supplies, sells, offers for sale, or manufactures any consumer paint thinners and multi-purpose solvents for use in the District

PR 1143 will also require recordkeeping and require the submittal of an annual quantity and emissions report to allow the District to maintain an accurate VOC emissions inventory and track the progress of the VOC reductions. The rule will require all manufacturers of paint thinners and multi-purpose solvents to obtain an identification number prior to sale, which is expected to enhance compliance and allow the District to monitor the sales and emissions of all consumer paint thinners and multi-purpose solvent products. This proposed rule will:

1. Establish the VOC limit for consumer paint thinners and multi-purpose solvents to 25 g/L, effective January 1, 2010.
2. Proposed definitions:
 - **Consumer** means any person who seeks, purchases, or acquires any consumer product for personal, family, household, or institutional use. Persons acquiring a consumer product for resale are not “consumers” for that product.
 - **Distributor** means any person to whom a consumer product is sold or supplied for the purposes of resale or distribution in commerce, except that manufacturers, retailers, and consumers are not distributors.
 - **Paint Thinner** are solvents that are manufactured for the purpose of reducing the viscosity of coating compositions or components and displays the term “Paint Thinner”, “Lacquer Thinner”, “Thinner”, or “Reducer” on the front panel of its packaging.
 - **Multi-purpose Solvents** include:
 - A. Products that do not display specific use instructions on the product container or packaging,

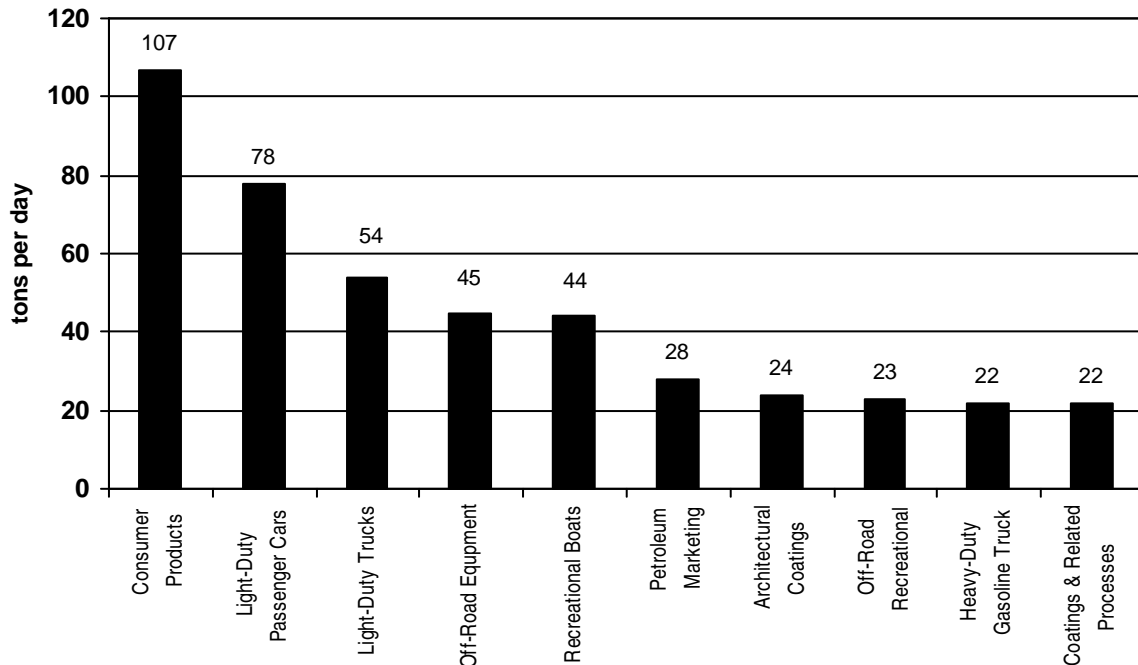
- B. Products that do not specify an end-use function or application on the product container or packaging, and
 - C. Solvents used in institutional facilities, except for laboratory reagents used in analytical, educational, research, scientific or other laboratories.
- **Retail Outlet** means any establishment at which consumer products are sold, supplied, or offered for sale directly to consumers.
 - **VOC:**
 - Is any volatile compound of carbon, excluding methane, carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, ammonium carbonate, and exempt compounds.
 - Grams of VOC per liter of material.
3. Create a mechanism for distributors and manufacturers distributing products in the SCAQMD to submit an application to obtain an ID number.
4. Require Recordkeeping:
- Maintain a copy of the ID number application receipt.
 - Maintain records of annual consumer paint thinner and multi-purpose solvent sales and determine VOC emissions. These records shall include,
 - Production records
 - Distribution records
 - Sales records
5. Identify exemptions:
- Products manufactured for areas outside of the AQMD.
 - Certain solvents necessary for thinning of industrial maintenance coatings and clean-up of polyaspartic and polyurea coatings.
 - Educational and research use.
 - Sell-through

The VOC reduction is estimated to be 9.76 tpd by the year 2014.

VI. EMISSIONS INVENTORY

This proposed rule would seek to reduce VOCs from consumer paint thinners and multi-purpose solvents sold as consumer products by establishing a VOC content limit for each category. Graph 1 shows the estimated VOC emissions for consumer products in 2014 and

compares these emissions to other large categories of VOC emissions in the basin. The consumer products category is the largest category and shows that by the year 2014, the VOC emissions from consumer products are expected to be 107 tpd.



GRAPH 1: CONSUMER PRODUCTS VERSUS MANY OTHER CATEGORIES FOR VOC EMISSIONS – YEAR 2014.

CARB has and continues to lower VOC emissions from consumer products. The most recent CARB proposal aims to reduce 2.5 tpd of VOC from 25 different categories for consumer products in the South Coast AQMD jurisdiction by 2015. However, current rulemaking has been delayed to further assess the feasibility and any adverse environmental impacts.

The AQMP inventory for consumer paint thinners and multi-purpose solvents, based on CARB's Category of Emission Sources (CES) #88047 for multi-purpose solvents, is expected to increase from 6.3 tpd for year 2002 to 7.3 tpd by year 2014, and up to 7.6 tpd by year 2023, if uncontrolled. In addition to CES #88047, staff determined the applicability of two other CES inventories. The 2014 baseline emissions for the three CES are shown in Table 5 and sum-up to 10.2 tpd of VOC emissions.

VII. EMISSION REDUCTION – CURRENT INVENTORY

The proposed rule will establish a VOC content of 25 g/L for consumer paint thinners and multi-purpose solvents, and with the majority of current sales comprised of high VOC solvents, the sales weighted average VOC content is approximately 736 g/L.

The 2007 AQMP shows that the baseline emissions for selected consumer products including lacquer thinners and paint thinners by the year 2014 will be 7.3 tpd. However, AQMD's current baseline inventory, which includes the applicable VOC sources, is summarized below.

TABLE 5: BREAKDOWN OF AVAILABLE CES SOURCES

INVENTORY DESCRIPTION	CES #	VOC EMISSIONS (tpd)
Multi-purpose Solvents	88047	7.450
Clean-up Solvents	92106	0.969
Thinning Solvents	92114	1.783
	TOTAL	10.202

The volume for each CES can also be determined by using the sales weighted average 736 g/L,

$$736 \text{ g/L} * (1 \text{ lb/Gal} / 119.83 \text{ g/L}) = 6.14 \text{ lb/Gal VOC, and,}$$

$$\text{Multi-purpose Solvents, CES \#88047} = 7.45 \text{ tpd} = 14,900 \text{ ppd of VOC emissions,}$$

$$(14,900 \text{ pounds} / 6.14 \text{ ppd}) * 1 \text{ day} = 2,426.7 \text{ gallons/day} = 885,745.5 \text{ gallons/yr}$$

$$\text{Cleanup Solvents, CES \#92106} = 0.969 \text{ tpd} = 1,938 \text{ ppd of VOC emissions,}$$

$$(1,938 \text{ pounds} / 6.14 \text{ ppd}) * 1 \text{ day} = 315.6 \text{ gallons/day} = 115,194 \text{ gallons/yr}$$

$$\text{Thinning Solvents, CES \#92114} = 1.783 \text{ tpd} = 3,566 \text{ ppd of VOC emissions,}$$

$$(3,566 \text{ pounds} / 6.14 \text{ ppd}) * 1 \text{ day} = 580.8 \text{ gallons/day} = 211,992 \text{ gallons/yr}$$

The total solvent usage for these three categories is estimated to be 3,323.1 gallons per day or 1,212,931.5 gallons per year

Using the sales weighted average of approximately 736 g/L VOC and the proposed VOC limit of 25 g/l, the rule proposes a 96.6% reduction in the VOC limit. This is calculated by,

$$\{(SWA \text{ VOC} - \text{Proposed VOC}) / SWA \text{ VOC}\} = \{(736 - 25) / 736\} = 0.966 \text{ or } 96.6\%,$$

The anticipated total emission reduction can then be calculated by,

$$10.2 \text{ tpd} * 96.6\% = 9.85 \text{ tpd by 2014}$$

However, the proposed exemptions are estimated to account for approximately 0.1 tpd of VOC emissions. Therefore, implementation of this proposed rule is expected to achieve emission reductions of up to 9.76 tpd by the year 2011. Any emission reductions resulting from the implementation of this control measure will be credited towards AQMD's SIP obligation.

It should be pointed out that during the rule development process, arguments have been made that the actual emission inventory may be significantly lower than the one estimated above, which was based on the latest CARB survey, already several years old. The potential overlap among different categories, implementation of Rules 1113 and 1171, which is catalyzing the

migration toward waterborne products that do not require thinning or clean-up with VOC-based solvents, has been given as plausible reasons for a lower inventory. While the arguments presented may have an impact on the inventory, until a new survey is conducted, staff is obligated to use the inventory estimate based on the latest CARB data used in the 2007 AQMP. Staff is committed to adjust the inventory once more updated survey information becomes available. However, it should also be pointed out, regardless of the size of the inventory, the estimated relative percent reduction expected should remain the same when migrating from conventional solvents to alternative compliant products.

VIII. COST ANALYSIS

Proposed Rule 1143 implements Control Measure CTS-04 from the 2007 Air Quality Management Plan. This rule, if adopted, will affect retail outlets that currently offer for sale high-VOC containing consumer paint thinners and multi-purpose solvents. The consumer will also be affected by the difference in cost of the substitute products used to replace the high-VOC containing solvents. Essentially, the low-VOC substitute consumer paint thinners and cleaners will displace the high-VOC containing consumer paint thinners and multi-purpose solvents in all the retail outlets in the AQMD jurisdiction.

The AQMD estimates that 1,212,931.5 gallons of high-VOC paint thinners and multi-purpose solvents are sold by retail outlets in the AQMD jurisdiction per year. Based on the estimated 11,891 gallons of solvents that are proposed to meet the exemption in PR 1143, the volume for reformulated products is therefore estimated to be 1,201,040.5 gallons. AQMD staff surveyed prices for the high-VOC paint thinners and multi-purpose solvents, and then averaged the prices for quart size and gallon size containers, the standard size containers sold by the retail outlet stores. AQMD staff also calculated the sales weighted average for the high-VOC containing products and determined a value of 736 g/L of VOC. The average cost for the high-VOC containing products were determined to be,

\$7.18 / Quart and \$18.01 / Gallon

The emissions for one year, based on the 1,201,040.5 gallons estimate, are calculated as,

*$736 \text{ g/L} * (1 \text{ lb/gal}/119.83 \text{ g/L}) * 1,201,040.5 \text{ gal/yr} = 7,376,832.3 \text{ lbs/yr or } 3,688.4 \text{ tons/yr}$*

To determine emissions per day, the factor 365 days/yr is used because the retail outlets offer the high-VOC products for sale 7 days a week,

$(3,688.4 \text{ tons/yr})/(365 \text{ days/yr}) = 10.1 \text{ tons/day}$

The new technologies are based on three different chemistries, exempt solvents, exempt solvent based aqueous, and soy based products.

ACETONE AND ACETONE-BASED TECHNOLOGY

Acetone is an exempt compound pursuant to District Rule 102 and is considered a zero VOC product. AQMD staff surveyed several acetone products and averaged the prices for quart

container and one-gallon container sizes,

\$8.44/quart and \$21.05/gallon

The cost-effectiveness can therefore be calculated for the acetone quart size containers by using,

$$\begin{aligned} & (\$Cost_{Acetone} - \$Cost_{High-VOC})/Qt / (VOC_{High-VOC} - VOC_{Acetone}), \\ & (\$8.44 - \$7.18)/Qt / (736 \text{ g/L} - 25 \text{ g/L}) = \\ & (\$8.44 - \$7.18)/Qt / (6.14 \text{ lb/Gal} - 0.21 \text{ lb/Gal}) * (4 \text{ Qt/gal}) = \$0.8499/\text{lb or } \$1,699.83/\text{ton of VOC} \\ & \{ \text{Note: } 736 \text{ g/L(lb/gal)} / 119.83 \text{ g/l} = 6.14 \text{ lb/gal and } 25 \text{ g/L(lb/gal)} / 119.83 \text{ g/l} = 0.21 \text{ lb/gal} \} \end{aligned}$$

The cost-effectiveness can therefore be calculated for the acetone one-gallon size containers by using,

$$\begin{aligned} & (\$Cost_{Acetone} - \$Cost_{High-VOC})/Gal / (VOC_{High-VOC} - VOC_{Acetone}), \\ & (\$21.05 - \$18.01)/Gal / (6.14 \text{ lb/Gal} - 0.21 \text{ lb/Gal}) = \$0.5127/\text{lb or } \$1,025.30/\text{ton of VOC} \end{aligned}$$

AQUEOUS BASED CLEANERS

There are aqueous products that meet the 25 g/L and less VOC limits that are currently available. Staff averaged the prices for quart container and one-gallon container sizes and found,

\$7.25/quart and \$33.39/gallon

The cost-effectiveness can therefore be calculated for the aqueous quart size containers by using,

$$\begin{aligned} & (\$Cost_{Aqueous} - \$Cost_{High-VOC})/Qt / (VOC_{High-VOC} - VOC_{Aqueous}), \\ & (\$7.25 - \$7.18)/Qt / (6.14 \text{ lb/Gal} - 0.21 \text{ lb/Gal}) * (4 \text{ Qt/gal}) = \$0.0472/\text{lb or } \$94.44/\text{ton of VOC} \end{aligned}$$

The cost-effectiveness can therefore be calculated for the aqueous one-gallon size containers by using,

$$\begin{aligned} & (\$Cost_{Aqueous} - \$Cost_{High-VOC})/Gal / (VOC_{High-VOC} - VOC_{Aqueous}), \\ & (\$33.39 - \$18.01)/Gal / (6.14 \text{ lb/Gal} - 0.21 \text{ lb/Gal}) = \$2.5936/\text{lb or } \$5,187.18/\text{ton of VOC} \end{aligned}$$

SOY BASED CLEANERS

There are soy based products that meet the 25 g/L and less VOC limits that are currently available. Staff averaged the prices for quart container and one-gallon container sizes and found,

\$9.99/quart and \$32.51/gallon

The cost-effectiveness can therefore be calculated for soy based quart size containers by using,

$$\begin{aligned} & (\$Cost_{Soy} - \$Cost_{High-VOC})/Qt / (VOC_{High-VOC} - VOC_{Soy}), \\ & (\$9.99 - \$7.18)/Qt / (6.14 \text{ lb/Gal} - 0.21 \text{ lb/Gal}) * (4 \text{ Qt/gal}) = \$1.8955/\text{lb or } \$3,790.89/\text{ton of VOC} \end{aligned}$$

The cost-effectiveness can therefore be calculated for the soy based one-gallon size containers

by using,

$$(\$Cost_{Soy} - \$Cost_{High-VOC})/Qt / (VOC_{High-VOC} - VOC_{Soy}),$$
$$(\$32.51 - \$18.01)/Gal / (6.14 \text{ lb/Gal} - 0.21 \text{ lb/Gal}) = \$2.4452/\text{lb or } \$4,890.39/\text{ton of VOC}$$

PCBTF BASED CLEANERS

There are PCBTF products that meet the 25 g/L and less VOC limits that are currently available. AQMD staff surveyed several PCBTF products and found several examples with less than 25 g/L of VOC content. Staff averaged the prices for quart container and one-gallon container sizes and found,

\$16.95/quart and \$52.63/gallon

The cost-effectiveness can therefore be calculated for PCBTF quart size containers by using,

$$(\$Cost_{PCBTF} - \$Cost_{High-VOC})/Qt / (VOC_{High-VOC} - VOC_{PCBTF}),$$
$$(\$16.95 - \$7.18)/Qt / (6.14 \text{ lb/Gal} - 0.21 \text{ lb/Gal}) * (4 \text{ Qt/gal}) = \$6.5902/\text{lb or } \$13,180.44/\text{ton of VOC}$$

The cost-effectiveness can therefore be calculated for PCBTF one-gallon size containers by using,

$$(\$Cost_{PCBTF} - \$Cost_{High-VOC})/Gal / (VOC_{High-VOC} - VOC_{PCBTF}),$$
$$(\$52.63 - \$18.01)/Gal / (6.14 \text{ lb/Gal} - 0.21 \text{ lb/Gal}) = \$5.8381/\text{lb or } \$11,676.22/\text{ton of VOC}$$

Staff assumes a weighted market penetration for the various technologies and using the cost-effectiveness figures noted above for one-gallon size containers only, the overall cost-effectiveness is as follows:

$$\{(0.50 * \text{Acetone technology}) + (0.30 * \text{Aqueous technology}) + (0.15 * \text{soy based technology}) + (0.05 * \text{PCBTF technology})\},$$
$$\{[(0.50 * 1,025.30) + (0.30 * 5,187.18) + (0.15 * 4,890.39) + (0.05 * 11,676.22)]/\text{ton},$$
$$(\$512.65 + 1,556.16 + 733.56 + 583.81)/\text{ton} = \$3,386.18/\text{ton of VOC average}$$

Therefore, the overall cost-effectiveness is estimated to be \$3,386/ton of VOC.

IX. INCREMENTAL COST-EFFECTIVENESS

Under Health and Safety Code §40920.6, the AQMD is required to perform an incremental cost analysis when adopting a Best Available Retrofit Control Technology (BARCT) rule or feasible measure required by the California Clean Air Act. To perform this analysis, the AQMD must (1) identify one or more control options achieving the emission reduction objectives for the proposed rule, (2) determine the cost effectiveness for each option, and (3) calculate the incremental cost effectiveness for each option. To determine incremental costs, the AQMD must “calculate the difference in the dollar costs divided by the difference in the emission reduction potentials between each progressively more stringent potential control option as compared to the next less expensive control option.”

Proposed Rule 1143 implements Control Measure CTS-04 from the 2007 Air Quality Management Plan. Because Control Measure CTS-04 is intended to meet feasible measure requirements under the California Clean Air Act, an incremental cost analysis is required and is presented below.

Since alternative control strategies are limited for this area source, staff evaluated two alternative options that would affect all the paint thinner and multi-purpose solvent products normally found at large box stores such as Home Depot, Lowe's and Orchard Supply Hardware, as well as the smaller retail sales outlets. Staff analyzed one of the alternative options by reducing the VOC content for all consumer paint thinner and multi-purpose solvent products to 0 (zero) grams per liter. This option relies upon the use of mainly exempt solvents including acetone, PCBTF, and methyl acetate. Another alternative option staff analyzed was to reduce the VOC content for most consumer paint thinner and multi-purpose solvent products to 25 grams per liter of VOC. This would provide a product formulation range of 0 to 25 grams per liter for consumer paint thinners and multi-purpose solvents.

Staff proposes the alternative option which would lower the VOC content to a maximum of 25 grams per liter of VOC. This option will net a reduction of 9.76 tpd of VOC emissions at a cost of \$12,968,354.90 whereas the zero VOC alternate option would net a reduction of 10.1 tpd of VOC emissions at a cost of \$16,176,940.41. Table 6 summarizes the total costs and incremental cost effectiveness of each of three options including a third alternate option of no projects, a reduction to a maximum of 25 grams per liter and a reduction to 0 (zero) grams per liter of VOC.

TABLE 6: COMPARISON OF VOC LIMIT REDUCTIONS AND COSTS

VOC LIMIT (g/L)	VOC REDUCTION (tpy)	ANNUAL COST INCREASE	INCREMENTAL COSTS	INCREMENTAL COST- EFFECTIVENESS (\$/tpy)
> 736	0.0	\$0.00	\$0.00	\$0.00
25	3,563.1	\$12,968,354.90	\$12,968,354.90	\$3,639.60
0	3,688.4	\$16,176,940.41	\$3,208,585.51	\$25,610.11

X. CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

Pursuant to the California Environmental Quality Act (CEQA) and the AQMD's Certified Regulatory Program (Rule 110), appropriate documentation was prepared to analyze any

potential adverse environmental impacts associated with the Proposed Rule 1143. The Draft EA is attached with this staff report.

XI. SOCIOECONOMIC ASSESSMENT

A socioeconomic analysis of Proposed Rule 1143 will be performed. A draft report will be released no later than 30 days prior to the AQMD Governing Board hearing.

XII. COMPARATIVE ANALYSIS

Health and Safety Code § 40727.2 requires a written analysis comparing the proposed rule with existing AQMD and Federal regulations. Federal regulations do not regulate VOC emissions from consumer paint thinners and multi-purpose solvents. AQMD Rule 1113 applies to consumers for the use of architectural coatings but does not overlap with the requirements of this rule. Rule 442 may apply to some consumer uses; however the daily use limits per facility are above those used by a consumer. Other AQMD coating and solvent rules apply to the industrial uses. No other AQMD rules apply to solvent and thinner use for consumers.

XIII. DRAFT FINDINGS

Health and Safety Code § 40727 requires that prior to adopting, amending or repealing a rule or regulation, the AQMD Governing Board shall make findings of necessity, authority, clarity, consistency, non-duplication, and reference based on relevant information presented at the hearing. The draft findings are as follows:

Necessity – State and federal health-based ambient air quality standards for ozone are exceeded in the AQMD. The reduction of VOC from Proposed Rule 1143 is part of a comprehensive strategy to meet federal and State air quality standards.

Authority - The AQMD Governing Board obtains its authority to adopt, amend, or repeal rules and regulations from Health and Safety Code §§ 39002, 40000, 40001, 40440, 40441, 40702, 41508, and 41700.

Clarity - The AQMD Governing Board has determined that Proposed Rule 1143 – Consumer Paint Thinners and Multi-purpose Solvents, is written and displayed so that the meaning can be easily understood by persons directly affected by them.

Consistency - The AQMD Governing Board has determined that Proposed Rule 1143 – Consumer Paint Thinners and Multi-purpose Solvents, is in harmony with, and not in conflict with or contradictory to, existing statutes, court decisions, federal or state regulations.

Non-Duplication - The AQMD Governing Board has determined that Proposed Rule 1143 – Consumer Paint Thinners and Multi-purpose Solvents, does not impose the same requirement as any existing state or federal regulation, and the proposed amendments are necessary and proper to execute the powers and duties granted to, and imposed upon, the AQMD.

Reference - In adopting this regulation, the AQMD Governing Board references the following

statutes which the AQMD hereby implements, interprets or makes specific: California Health and Safety Code §§ 40001, 40440, and 40702.

XIV. DRAFT CONCLUSIONS AND RECOMMENDATIONS

Staff recommends that PR 1143 be adopted to further reduce VOC emissions from consumer products and implement control measure CM#2007CTS-04 of the 2007 Air Quality Management Plan.

XV. PUBLIC COMMENTS AND RESPONSES

INDUSTRY CONCERNS

Jurisdictional Regulatory Authority

NPCA contends that the AQMD does not have the authority to regulate consumer paint thinners and multi-purpose solvents because state law preempts district rulemaking. The NPCA points to a Senate Floor Analysis for SB 230 (September 10, 1997) as well as the Assembly Floor Analysis of September 5, 1997 which state, in relevant part, that “this provision [Cal. Health & Safety Code § 41712] precludes those districts from adopting regulations when the ARB has not done so.”

District Response

Under Health and Safety Code section 41712, CARB can regulate certain consumer products. Local air districts, however, can adopt standards for consumer products that CARB has not yet regulated. *See* Cal. Health & Safety Code § 41712(f). CARB does not currently regulate consumer paint thinners and multi-purpose solvents. Accordingly, the District can regulate these products.

The intent of the Legislature to authorize the districts to regulate consumer products is clear from the statutory language itself. Section 41712(f) states:

A district shall adopt no regulation pertaining to disinfectants, nor any regulation pertaining to a consumer product that is different than any regulation adopted by the state board for that purpose.

Cal. Health & Safety Code § 41712(f). The second clause of Section 41712(f) authorizes local air districts to adopt consumer product regulations unless they are different from a regulation already adopted by CARB. If the Legislature intended to preclude the districts from regulating consumer products altogether, it would have stated as such. Indeed, the first clause of Section 41712(f) (“A district shall adopt no regulation pertaining to disinfectants”) illustrates that the Legislature knew how to choose words that effectuate complete preemption. *See also* Cal. Health & Safety Code § 41712(i)(1) (“A district shall not adopt or enforce any regulation regarding . . . aerosol paints until the state board has adopted a regulation regarding those paints, and any district regulation shall not be different than the state board regulation.”) Accordingly, if the Legislature meant for CARB to occupy the field of consumer product

regulation, it would have simply stated: “A district shall adopt no regulation pertaining to consumer products.” But it did not do so.

Given that the language of Section 41712(f) is unambiguous, there is no need to consider legislative intent. *Lungren v. Deukmejian*, 45 Cal. 3d, 727, 735 (1988). However, the legislative history of Section 41712(f) further supports the District’s authority to regulate in this instance.

In 1988, Health and Safety Code section 41712(a) authorized CARB to adopt regulations “to achieve the maximum feasible reduction in reactive organic compounds emitted by consumer products.” During that time, Section 41712 included the following provision: “Prior to January 1, 1994, a district shall adopt no regulation relating to a consumer product which is different than any regulation adopted by the state board for that purpose.” Notably, the statute – even at its inception – did not completely prohibit local air districts from regulating consumer products. The Legislature subsequently amended Section 41712 in 1992 to “revise the definition of consumer products to include aerosol paints” and to “extend indefinitely the prohibition on the adoption by a district of different regulations.” Legislative Counsel of California, Enrolled Bill Rep. on Assem. Bill No. 2783 prepared for Governor Wilson (September 23, 1992) p. 4. Again, the Legislature expressly limited local air districts from adopting “different regulations,” not consumer product “regulations” altogether.

In 1997, the Legislature further amended Section 41712(f) by adding the following language: “A district shall adopt no regulation pertaining to disinfectants.” Stats 1997 ch 689 § (SB 230). The 1997 amendments to Section 41712(f) did not intend to prevent air districts from regulating all consumer products when CARB has not regulated. Instead, as evidenced by the following Enrolled Bill Report⁷ for SB 230, these amendments only intended to close a regulatory loophole for disinfectants:

When the California Clean Air Act was adopted in 1988, ARB was given responsibility for regulating consumer products. The implication is that consumer products will be regulated by ARB, not local districts. However, current law contains what may be a loophole. While current law says that air districts cannot adopt regulations “different than [sic]” ARB, it does not address the situation in which no ARB regulation has yet been adopted.

In theory, ***this allows an air district to adopt regulations when ARB has no regulation in place*** . . . The sponsor, therefore, has closed the loophole for its product category by prohibiting a local air district from adopting any regulation of the disinfectants at any time.

California Environmental Protection Agency, Air Resources Board, Enrolled Bill Rep. on Senate Bill No. 230 (September 23, 1997) p. 2 (emphasis added). The 1997 amendments to Section 41712(f) were only intended to preclude local air districts from regulating a particular consumer product category, namely disinfectants. By doing so, however, it did not change the

⁷ Courts have routinely found enrolled bill reports instructive on matters of legislative intent. See *Elsner v. Uveges*, 34 Cal. App. 4th 915, 934, fn. 19. (2004).

law regarding an air district's authority to regulate other consumer products in the absence of CARB regulations.

Finally, CARB has consistently interpreted Section 41712(f) as allowing local air districts to regulate consumer products that have not yet been regulated by CARB. In 1995, CARB opined that districts are not restricted from regulating "a particular consumer product category unless VOC standards for that category have already been established by the ARB." Memorandum from Michael Kenney, General Counsel, CARB to Peter Venturini, Chief, Stationary Source Division (August 23, 1995). Six years later, CARB clarified that its 1995 opinion "essentially concludes that: (1) a district may establish VOC standards for product categories that have not been regulated by ARB" Letter from Kathleen Walsh, General Counsel, CARB to William Wong, Senior Deputy District Counsel, SCAQMD (February 20, 2001). This interpretation was confirmed again in 2002. Letter from Kathleen Walsh, General Counsel, CARB to Barbara Baird, District Counsel, SCAQMD (July 31, 2002). ("My conclusions are not changed"). These legal opinions reflect CARB's administrative interpretations and are entitled to consideration by a court. *See Yamaha Corporation of America v. State Board of Equalization*, 19 Cal. 4th 1, 15 (1998).

Flammability of Acetone

The NPCA contend that acetone has an extremely high flammability risk and is inappropriate for consumers, as compared to a low odor mineral spirits. Their concerns maintain that acetone could significantly increase fire hazards associated with transportation, storage, use, and disposal of clean-up solvent. The NFPA has rated acetone as 3 on their rating system, meaning that acetone is a high flammability solvent. Table 1 showed that all of the other multi-purpose solvents and lacquer thinners have a rating of 3 for flammability as well, with the exception of mineral spirits that is rated by the NFPA as a 2. Acetone does have a lower flash point than most of the other solvents, but common multi-purpose solvents and lacquer thinners, which use acetone in their solvent blend, have similar flash points. Methyl Ethyl Ketone also has a low flash point albeit not as low as acetone, but much less than the other multi-purpose solvents. Acetone, Isopropyl Alcohol, Lacquer Thinner, MEK, Toluene, and VM&P Naphtha all have flash points less than room temperature (68°F), so the high flammability risk for acetone is similar to the currently available high-VOC solvents. The storage of acetone or the use would not be expected to result in significant adverse hazardous impacts. Acetone vapors will not cause an explosion unless the vapor concentration exceeds 26,000 ppm. In comparison, toluene vapors can cause an explosion at 12,000 ppm whereas mineral spirits and toluene vapor concentrations can cause an explosion at 10,000 ppm. There is an increased concern regarding the flammability of acetone. However, its primary use will be as a thinner for solvent-based products which have a relatively small volume in comparison to the total volume of coatings sold. For cleaning and multi-purpose solvent use, there is no reason to believe that acetone will be the alternative of choice.

Inclusion of Reactivity Based Approach

A portion of the stakeholders favor a reactivity-based approach to approving solvents for use under the proposed rule. The USEPA exempted acetone as a VOC, but does not recognize a reactivity-based ozone control strategy for architectural coatings and clean-up solvents. Staff will continue to study the impacts of a reactivity based approach, with consideration for toxics and PM_{2.5} formation.

This section reflects the public comments received during the public workshop held November 5, 2008 and the subsequent public comment periods and staff responses.

Comment #1

Our blends have been tested and validated in both alkyd and latex paint blends. We are seeing the emergence of new blends with our partners that will dramatically expand the usefulness of these products across the full spectrum of applications that paint and lacquer thinners are currently used. These formulations include both solvent and water based systems and will satisfy the requirements of most coatings, even high performance coatings.

Response to Comment #1

Staff's technology assessment identified the availability of compliant multi-purpose solvents and paint thinners, including lacquer thinners. The Staff Report includes a listing of these products that are available for both waterborne and solvent-based systems. Staff recognizes the innovative work conducted by some manufacturers and further recognizes that additional blends are constantly being developed for use. This trend is expected to continue as the implementation of PR1143 requirements creates an additional market demand for these lower-VOC multi-purpose solvents and paint thinners.

Comment #2

We've had these (< 25 g/L VOC compliant) products for quite a long time. The major point that I wanted to bring out is these products are available and we're blending more in the next few months. I think they'll be viable for the job for the public not only our blends but other blends from Klean Strip, Sunnyside, and the rest. One of them, the lacquer thinner, is already certified through the clean air program which you are well aware of currently.

Response to Comment #2

See response to comment #1. Based on other rules adopted, staff recognizes the growth in available compliant products that results from regulatory requirements. With this in mind, PR 1143 contains a 12 month timeline for implementation to provide time for additional compliant products to be formulated and commercialized.

Comment #3

We believe that the South Coast (AQMD) lacks the legal authority to adopt Proposed Rule 1143 under the California Clean Air Act. The California Health & Safety Code § 41712 designates CARB as the primary authority for regulating air emissions from consumer products in the state of California.

Response to Comment #3

Control Measure CTS-04 of the 2007 AQMP specifically calls for emission reductions from consumer paint thinners and multi-purpose solvents that are not regulated by CARB. Although California Health and Safety Code § 41712 authorizes CARB to regulate certain consumer products, local air districts retain the authority to adopt VOC standards for any consumer product category for which CARB has not already adopted a standard. See Cal. Health & Safety Code § 41712(f). Because CARB has not adopted any rules or regulations that currently

address consumer paint thinners and multi-purpose solvents, the AQMD has the authority to regulate this category of consumer products.

Comment #4

Manufacturers and consumers of these products will be faced with two different rulemakings in California, depending on where they manufacture, sell, shop and/or use the products, leading to widespread compliance and enforcement confusion. The district should work with CARB to develop a regulation that is feasible statewide to avoid duplication and confusion and to provide a uniform regulation as intended by the legislature.

Response to Comment #4

The AQMD staff recognizes that CARB staff is currently working on an amendment to the consumer products regulation for this category, with a scheduled public hearing date of June 2009. However, draft rule language or implementation dates have not been discussed yet. Additionally, based on CARB's delay on rulemaking pertaining to other categories in the consumer products regulation, the AQMD staff believes that an expedited rulemaking is necessary to implement CTS-04 in a timely manner. The proposed rule seeks to reduce VOCs by 9.76 tpd, a 95.7% reduction from the current inventory of 10.2 tpd. AQMD staff is working closely with CARB and plans to make available all supporting documents to CARB, should they continue to pursue a stationary rule, as they have done for the last two iterations of the Suggested Control Measure for Architectural Coatings.

Comment #5

South Coast's proposed mass-based VOC standard will compromise product performance and safety. Performance issues such as cobwebbing, solvent blushing and humidity blushing can be caused by rapid solvent evaporation rates. The safety risks include flammability and unintentional damage to common plastics such as PVC and acrylics.

Response to Comment #5

The comment about compromising performance is speculative, and no data, reports, or case study has been provided to indicate any impact on performance of the product or safety issues related to the use of alternative, compliant products. The manufacturers of alternative, compliant, multi-purpose solvents, paint thinners, and lacquer thinners have testified in the public workshop, CARB meetings, as well as the working group meetings, that they can easily reformulate their products to match the evaporation rate of existing multi-purpose solvents and paint thinners. Typically, the issues of cobwebbing, humidity blushing, and solvent blushing are related to clear wood finishes such as lacquer. However, these issues are more of a concern in cooler, higher humidity areas, not typically found in the District. As indicated in comment #1 and included in our Certified Clean Air Solvent List, there is a compliant lacquer thinner currently available and is used both for thinning and clean-up. Furthermore, as indicated in the staff report, the volume of solvent-based coatings in use has reduced significantly with amendments to Rule 1113, with majority of the sales comprised of waterborne coatings, including lacquers. Lastly, for industrial maintenance coatings, the initial proposal has been revised to include an exemption for the sale and use of thinners specifically designated as thinners for industrial maintenance coatings. Presumably, the safety concerns assume that the only compliant alternative is acetone, which is only one of the alternative chemistries available for complying with the proposed rule.

Comment #6

A 25 g/L VOC limit for all uses of thinners and solvents is not technologically feasible. While acetone can be used to a certain degree, a significant new increase in the use of acetone can be counter productive and potentially hazardous. Our studies show that the acetone or a low VOC formula with acetone versus mineral spirits is counter productive for controlling VOC emissions. Acetone, an exempt compound, has an MIR of 0.48 whereas mineral spirits has a MIR of ~0.8. Mineral spirits create less ozone than acetone. Our cleaning results show 20 to 30 times higher emissions with acetone than mineral spirits because of the higher evaporation rate of acetone.

Response to Comment #6

A detailed analysis of CARB's Reactivity Report for Architectural Coatings survey shows usage of other mineral spirits that have significantly higher MIR values. Nonetheless, directly comparing mineral spirits (IIC only) to acetone in terms of reactivity shows that an emission reduction would occur as long as acetone usage was less than twice the mineral spirits usage. This is consistent with the usage levels observed from companies that have switched from high VOC clean-up solvent to ultra-low solvents. There is no evidence other than the comment that acetone usage will result in 20 to 30 times higher emissions. Staff's assessment indicated that more than twice the amount of acetone will be needed to accomplish the same task compared to mineral spirits with the lowest MIR value. Some previous studies have shown a maximum increase of 20% acetone compared to mineral spirits, which would still result in overall ozone reduction.

Comment #7

We believe a reactivity based limit is more feasible and more appropriate. Reactivity-based standards, more effectively reduce the ozone-forming potential of solvent-based products while providing formulators with greater flexibility. Toxicity issues can easily be addressed in reactivity based regulation in the exact same method as done in mass based regulation by prohibiting certain highly toxic compounds. SCAQMD should incorporate reactivity criteria as an option to allow formulators the flexibility of utilizing effective thinning solvents while still providing significant emission reductions.

Response to Comment #7

Staff supports a reactivity-based approach to control ozone, but based on other comments received, recognizes the need to analyze potential adverse impacts of this alternative approach. One of the main concerns is that potential constituents may have toxicity associated with some VOC containing compounds that have a relatively low MIR value. Other issues that need to be evaluated include secondary organic aerosol formation, specific consensus methodology, and enforceability. Staff plans to work closely with CARB, USEPA, and the American Chemistry Council (ACC) to address these issues, and will include a board resolution to commit staff to evaluate the feasibility of a reactivity-based approach for thinners.

Comment #8

SCAQMD has not demonstrated that its proposed "one size fits all" standard is technologically feasible and that it would not compromise product performance and safety. SCAQMD must complete a technology study to demonstrate the feasibility of thinning all affected coatings with compliant alternatives to currently available solvents, which would be banned by the rulemakings.

Response to Comment #8

As indicated in the response to comment #5, staff has reviewed and identified the availability of various compliant technology for multi-purpose solvents and paint thinners, analyzed safety issues associated with flammability of acetone, and lastly has included an exemption for the sale and use of thinners specifically designated to thin industrial maintenance coatings.

Comment #9

The proposed 25 gpl limit is not feasible, especially for paint thinners. Clean-up is not the same as thinning since thinning materials need to be chosen such that they are compatible and do not degrade the coating or desired performance characteristics of the coating product. While it appears that a VOC limit of 3% by weight (~25 gpl) for multi-purpose solvents is technically feasible, it has not been demonstrated that the limit is feasible for thinning of all coatings.

Response to Comment #9

The 3% limit is feasible in most if not all substitutes for consumer paint thinners and multi-purpose solvents. Manufacturers of compliant thinners are able to match the evaporation rate of conventional high-VOC paint thinners and lacquer thinners. However, staff recognizes the need for specific thinners and reducers recommended for use with some industrial maintenance coatings, and therefore based on comments received, has added an exemption that will allow the sale and use of specific thinners to be used for thinning industrial maintenance coatings.

Comment #10

We agreed that it was appropriate to consult with the Office of the State Fire Marshall (OSFM) regarding the flammability of acetone. We are currently awaiting their assessment of the flammability risks that may be associated with an increased use of acetone.

Response to Comment #10

The AQMD Governing Board has previously adopted other rules (Rules 1113, 1122, 1136, 1171) that increased the use of acetone, and staff has extensively analyzed the flammability issue in the environmental assessments, including consultations with local fire agencies that concluded that acetone does not pose a greater risk than other conventional multi-purpose solvents in use today, including lacquer thinners, MEK, xylene, etc. Nonetheless, staff is working with CARB and the OSFM concerning the flammability issues with acetone and will incorporate new data when available.

Comment #11

TBAc should be exempted.

Response to Comment #11

District staff acknowledges the low photochemical reactivity of TBAc and its desirable physical and chemical properties but is concerned about its potential toxicity. TBAc has the potential to form a metabolite called tert butyl alcohol which is a carcinogen. In the past few years, AQMD has adopted very carefully crafted, limited exemptions for TBAc: for primers in auto body coating operations and for industrial maintenance coatings used in architectural coating operations. These operations, for the most part, are industrial operations where applicators wear personal protective equipment including respirators. Staff's intent in not providing an open ended exemption to TBAc was to limit, as demonstrated in the supporting

staff reports, potential risk to users, as well as receptors. Staff's expectation was that the product's vendor would have engaged OEEHA with additional study data that would settle pending concerns about TBAC's toxicity. Since OEEHA's concerns persist and alternative, less toxic products are currently available and in use for more than ten years, the District does not have any plans to include TBAC as an exempt alternate for this proposed rule focused on consumer use, considering that alternative and less toxic products are currently available and in use for more than ten years.

Comment #12

Low Vapor Pressure (LVP) as allowed by CARB would create a much broader base of technologies to choose from and utilize to meet the regulations. Most of these materials have qualities that are favorable compared to the currently available exempt solvents. We would endorse making these LVP options available and these LVP materials would help create a broader range of performance and price points needed to compete with traditional paint thinner technologies.

Response to Comment #12

The AQMD staff recognizes that CARB does not consider LVP chemicals as VOCs. However, the use of LVP solvents being used in consumer products is large and growing. Most consumer products are formulated to eventually completely evaporate. Otherwise, their product would leave an oily residue. Thus manufacturers tend to use LVPs that more readily volatilize. For example a glass cleaner may switch from isopropyl alcohol to an ethoxylated alcohol to lower the product's VOC content because the glycol ether would qualify as an LVP solvent. However, if using an AQMD test method to determine VOC content, the glycol ether would still contribute to the VOC content of the product. A previous evaluation of institutional and industrial cleaners indicates more than 50% contribution in VOCs from LVP solvents. While this may be a satisfactory standard for CARB, the AQMD does not exempt low vapor pressure solvents, since VOCs are released over time and are available to form ozone, as well as secondary organic aerosol.

Comment #13

A few gallons of mineral spirits would take months to evaporate. By contrast, acetone would take a couple of weeks to evaporate. Some consumers might decide that letting acetone evaporate is better than paying for the disposal of hazardous waste. This may result in large new amounts of acetone going into the air.

Response to Comment #13

There is no support for this speculative statement about acetone disposal. Nonetheless, to prevent this hypothetical practice, subparagraph (d)(3) includes a provision that requires the solvent container to be closed when not in use. Containers include drums, buckets, cans, pails, trays or any other container. Lastly, staff's technology assessment clearly shows the availability of other options, including other exempt solvents, bio-based products and aqueous products with low evaporation rates.

Comment #14

Soy methyl ester or a slow glycol either inhibits or retards the evaporation of acetone is not correct. These compounds are tail solvents and what is left over after the acetone has evaporated. The remaining solvent blend will then be rich in the slow solvent. These

compounds most often will permanently affect the paint film integrity that can cause early failure.

Response to Comment #14

This comment is speculative since no supporting information is included to support the claims. Please see responses to comments #5 and #8 for additional details. Acetone is only one of the alternative compliant technologies identified in the staff's technology assessment.

Comment #15

The Proposed Draft Staff Report states "The storage of acetone or use would not be expected to result in significant adverse hazardous impacts". Under normal working conditions, acetone has a flash point of 0 °F whereas mineral spirits has a flash point above 100 °F. Acetone has a much greater fire hazard risk. The use of acetone as a cleaner will result in exposing users to significantly increased risks from fires. Acetone has a comparable flash point to gasoline and surely the SCAQMD would not advocate its use as an indoor cleaner.

Response to Comment #15

Acetone is currently available for sale as of this time and has been used for several years by households, institutional and industrial users for several years. Local fire departments limit residential storage of flammable liquids to five gallons and recommends storage in a cool place. If the flammable coating container will be exposed to direct sunlight or heat, storage in cool water is recommended. Finally, all metal containers involving the transfer of five gallons or more should be grounded and bonded. Acetone has been and continues to be used by users in a safe manner. Even though gasoline and acetone have similar flash points gasoline is used as a fuel and not as a cleaner due to its well published toxicity. Lastly, acetone has a lower toxicity risk than commonly used multi-purpose solvents and lacquer thinners.

Comment #16

A 3 year sell-through is needed. Without a 3 year sell-through period many flammable and combustible paint thinners and multi-purpose solvents will be disposed of as hazardous wastes at great expense to stores, retailers, and manufacturers and this cost needs to be included in the CEQA analysis.

Response to Comment #16

The sell-through provision will provide the necessary time for retailers to eliminate the inventory of higher-VOC products with the lower-VOC products and allow manufacturers to phase in the compliant products, effective January 1, 2010. Industry had concerns that since other rules such as Rules 1113, 1168, 1171, and Proposed Rule 1144 were allowed sell-through provisions, solvents should also share the same. Therefore, staff revised Proposed Rule 1143 and increased the six month sell-through provision to one year, which is the same as several other existing and proposed AQMD rules.

Comment #17

Industrial Maintenance Coatings and small container exemptions are needed. Industrial Maintenance Coatings (IMC) need an exemption, and not just for polyaspartic and polyurea IM coatings.

Response to Comment #17

The proposed rule has been revised to include an exemption for the sale and use of thinners specifically designated to thin Industrial Maintenance Coatings. In addition, an exemption exists for the sale and use of solvents used exclusively for the cleaning of application equipment when used to apply polyaspartic and polyurea coatings. Previous studies have shown that available, compliant technology works well for the cleaning of most industrial maintenance coatings, including but not limited to zinc, epoxy, and urethane based technology. The small container exemption is most noted in the architectural coating rule (Rule 1113) and was provided for the repair and maintenance of existing coated substrates. The use of ultra-low VOC solvents for coating clean-up operations and other cleaning operations has been well established in the South Coast Air Basin. Staff believes that ample technology and over 100 products are available. Therefore, a small container exemption is not necessary for this category.

Comment #18

Administration requirements are overly burdensome. The list of distributors is totally infeasible. Why is it needed? CARB does the inventory, leave it at that.

Response to Comment #18

The proposed rule will require manufacturers and any of their distributors that supply consumer paint thinners and multi-purpose solvents with the intent to sell in the District to obtain a manufacture and distributor ID number, and submit annual quantity and emissions reports. These reports will be necessary to track the volume and emissions from the sale and use of the products, and most importantly establish an annual emissions inventory. The AQMD does not believe that these administrative requirements are overly burdensome, and has similar requirements in place in other rules.

Comment #19

Why are distribution records needed? This is not feasible for a national company. The AQMD does not have jurisdiction to require this. The manufacturers can't track this especially if it's sold to a Home Depot in D.C. This should apply to the retailers.

Response to Comment #19

The distribution records will be used for tracking the products that are sold in the District. The proposed rule also requires manufacturers to annually provide a list of distributors that sell products in the District regulated areas only so products sold through distributors can be tracked. The California Health and Safety Code § 42303 provides authority to the District to request records to determine VOC emissions.

Comment #20

What constitutes a distributor? The current rule language is ambiguous.

Response to Comment #20

A distributor is defined as “any person to whom a consumer product is sold or supplied for the purposes of resale or distribution in commerce, except that manufacturers, retailers, and consumers are not distributors” thus, a distributor is any person whom a consumer product is sold or supplied for the purposes of resale or distribution in commerce. Basically, the simplest way to determine the distributor is anyone that brings a multi-purpose solvent or paint thinner for sale into the AQMD.

Comment #21

The Staff Report included very few responses to comments. The District only included 3 responses (jurisdictional, acetone, and reactivity).

Response to Comment #21

Staff has addressed all comments and provided response from the public workshop and commentary period after the public workshop.

Comment #22

We are in full support of PR 1143. There is no need to delay the rule and it should go to the board in January. There are lots of alternate products available. Acetone is sold right now and consumers are already using it. It's also lower in toxicity.

Response to Comment #22

Staff agrees with the commenter and plans to hold the public hearing on January 9, 2009 for adoption. Staff has found 102 alternate products that are currently available, as well as acetone, a solvent that is currently available and has been for many years.

Comment #23

We would like to express our full support to: Establish a VOC limit of 25 gpl for consumer paint thinners and multi-purpose solvents, effective January 1, 2010, prohibit the sale and solicitation of non-compliant consumer paint thinners and multi-purpose solvents, require distributors and manufacturers of consumer paint thinners and multi-purpose solvents to obtain a distributor or manufacturers ID#, respectively, by July 1, 2009, require point-of-sale containers to display VOC content as supplied and for recommended dilution, date of manufacture, and registration confirmation. As AQMD weighs its decision to regulate these products, we urge you to work with other stakeholders and protect the health of those who are most exposed and vulnerable among us.

Response to Comment #23

Staff will be moving forward on proposed rule 1143. The South Coast Air Basin continues to experience the nation's worst air quality and looks forward to achieving the maximum feasible emissions reductions, estimated to be 9.76 tpd for Proposed Rule 1143. This will result in a significant reduction of emissions for the sixteen million Southern Californians that reside in the South Coast Air Basin. And finally, staff will continue to work with all the stakeholders in staff's distribution list.

Comment #24

The emissions inventory is outdated and some of the anticipated VOC reductions may have already been included in the SIP as a part of Rule 1171 – Solvent Cleaning amendments that required the use of 25 g/l clean-up solvents by professional painting contractors.

Response to Comment #24

The emissions inventory included in the staff report accounts for the reduction in VOC emissions, as claimed in Rule 1171 – Solvent Cleaning. While the arguments presented may have an impact on the inventory, until a new survey is conducted, staff is obligated to use the inventory estimate based on the latest CARB data used in the 2007 AQMP. Staff is

committed to adjust the inventory once more updated survey information becomes available. However, it should also be pointed out, regardless of the size of the inventory, the estimated relative percent reduction expected should remain the same when migrating from conventional solvents to alternative compliant products.

Comment #25

There are evidently soy based thinners available that would meet the proposed 3% statewide limit, but may not meet the SCAQMD proposed 25 g/L standard. This is because the soy based product may contain compounds that would not count towards a statewide limit in the consumer products rule, due to low vapor pressure compound (LVP-VOC) exemption, but would count towards the SCAQMD limit because of the absence of an LVP-VOC exemption in the SCAQMD rule.

Response to Comment #25

Staff has found several products using soy based technology that will comply with the 25 g/L VOC limit without a need for the low vapor pressure solvent exemption provided by CARB. Several of these have now been certified under the clean air solvent certification program that does not exempt LVP solvents and meets a VOC limit of 25 g/L. Based on discussions with developers of soy-based technology there are products available to utilize blends of exempt solvents along with soy blends that work and will cover the full spectrum of cleaning and thinning requirements.

XVI. REFERENCES

**Final 2007 Air Quality Management Plan – Appendix IV-A
(CM#2007CTS-04), June 2007**

http://www.aqmd.gov/aqmp/07aqmp/aqmp/appendix_IV-A.pdf

Initial Staff Proposals for Categories (Mass-Based)

California Air Resources Board
2008 Consumer Products Regulation Amendments
August 29, 2007

<http://www.arb.ca.gov/consprod/regact/cpwg2008/initialmassbase.pdf>

Clean Air Solvent (CAS) Certification Program and Suppliers of low-VOC Cleaning Materials and Equipment

<http://www.aqmd.gov/rules/cas/prolist.html>

Health and Safety Code §41712, Regulations to Control Volatile Organic Compounds in Consumer Products

2008 California Air Pollution Control Laws, 2008 Matthew Bender & Company, Inc., P.O. Box 7587, Charlottesville, VA 22906-7587, 800-446-3410, ISBN: 978-1-4224-4648-5
www.lexisnexis.com,

Low-VOC, Low Toxicity Alternatives for Consumer Product Cleanup and Thinning Solvents

IRTA March 2007

<http://www.irta.us/Consumer%20Products%20DTSC.pdf>

NFPA – National Fire Protection Association – MSDS

Entry last updated: Thursday, February 28, 2008

<http://ilpi.com/msds/ref/nfpa.html>

Final Staff Report for: Proposed Amended Rule 1171 – Solvent Cleaning Operations

October 1, 2003

Acetone, Denatured Alcohol, Isopropyl Alcohol, Lacquer Thinners, Methyl Ethyl Ketone, Mineral Spirits, Paint Thinners, Toluene, Turpentine, VM&P Naphtha, and Xylene,

<http://www.cdc.gov/niosh/pdfs/75-168a.pdf> (xylene)

Solvents;

Acetone, Denatured Alcohol, Isopropyl Alcohol, Lacquer Thinners, Methyl Ethyl Ketone, Mineral Spirits, Paint Thinners, Toluene, Turpentine, VM&P Naphtha, and Xylene,

<http://en.wikipedia.org/wiki/solvents>

APPENDIX A

BACKGROUND - SOLVENTS

Acetone

The discussion for acetone is covered in Section III of this Proposed Draft Staff Report.

Denatured Alcohol

Denatured alcohol is a colorless liquid and has a strong odor of ethanol. The term *denatured* means that it's toxic to human health and has no usefulness as a beverage. Denatured alcohol is an ethanol that can be used as a solvent for cleaning and in some cases, thinning. It can also be used as a sanding aid for sanding wood. Denatured alcohol can be found for sale at most large box stores and hardware stores.

As a VOC – Denatured alcohol is a high-VOC containing solvent. Staff researched multiple denatured alcohol MSDS documents that revealed a 24 g/L spread for the material VOC (791 g/L to 815 g/L).

Flammability – Denatured alcohol has a NFPA rating of 3 for flammability indicating that it is a highly flammable solvent.

Toxicology – Denatured alcohol has a NFPA rating of 1 for health rating which indicates that it has a slight health risk. The main health risk is ingestion which can cause blindness or death.

Isopropyl Alcohol

Isopropyl Alcohol is a colorless liquid and has a strong odor of rubbing alcohol. It's also referred to as isopropanol, isopro, rubbing alcohol and frequently abbreviated as "IPA". Isopropyl Alcohol is widely used as a solvent and dries rapidly. It is used commonly as a solvent to clean electronic circuits and electronic devices. Isopropyl Alcohol can be found for sale at most large box stores and hardware stores.

As a VOC – Isopropyl Alcohol is a high-VOC containing solvent. Staff researched multiple Isopropyl Alcohol MSDS documents that revealed a 28 g/l spread in the material VOC (787 g/L to 815 g/L).

Flammability – Isopropyl Alcohol has a NFPA rating of 3 for flammability indicating that it is a highly flammable solvent.

Toxicology – Isopropyl Alcohol has a NFPA rating of 1 for health rating which indicates it has a slight health risk. It is approximately twice as toxic as ethanol and can be fatal if swallowed and not treated. Isopropyl Alcohol is oxidized by the liver which then produces acetone from it. It can also irritate the eyes, nose, and throat for brief periods. Isopropyl oil, used in the manufacturing of isopropyl alcohol, has been linked to paranasal sinus cancer.

Lacquer Thinners

Lacquer Thinners are manufactured from petroleum distillates and blended with other solvents. It offers similar solvency as toluene but is normally less expensive. Lacquer thinners are used as thinners for epoxies, automotive paint and gravure inks for printing. The main use for

lacquer thinners is a thinning agent for nitrocellulose and acrylic lacquers.

As a VOC – Lacquer Thinner is a high-VOC containing solvent. Staff researched multiple lacquer thinner MSDS documents that revealed a 111 g/L spread in the material VOC (739 g/L to 850 g/L).

Flammability – Lacquer Thinner has a NFPA rating of 3 for flammability indicating that it is a highly flammable thinner.

Toxicology – Lacquer Thinner has a NFPA rating of 2 for health which indicates that it has a moderate health risk. The vapors from Lacquer Thinner can irritate the eyes, skin and upper respiratory tract. The vapors can also cause headache, nausea, dizziness, and loss of coordination. The liquid can cause redness of the skin and eyes.

MEK (Methyl Ethyl Ketone)

MEK is the acronym for Methyl Ethyl Ketone but it is also known as butanone. It is a manufactured organic solvent and has a butterscotch odor similar to acetone. It is used as a solvent because of its ability to dissolve gums, resins, cellulose acetate and nitrocellulose coatings.

As a VOC – MEK is a high-VOC containing solvent. Staff researched multiple MEK MSDS documents that revealed a 7 g/L spread in the material VOC (803 g/L to 810 g/L).

Flammability – MEK has a NFPA rating of 3 for flammability indicating that it is a highly flammable solvent.

Toxicology – MEK has a NFPA rating of 1 for health which indicates that it has a slight health risk. The vapors from MEK can irritate the nose, throat, skin, and eyes.

Mineral Spirits

Mineral Spirits is a petroleum distillate and is sometimes known as Stoddard solvent. Mineral spirits is used as a solvent to remove oils, grease, and carbon and as a cleaning agent added to thread cutting oils. Mineral spirits can be further refined to remove the aromatics resulting in a product called Odorless mineral spirits. The Odorless mineral spirits are favored for oil painting because they are less toxic and do not emit strong odors like mineral spirits.

As a VOC – Mineral spirits is a high-VOC solvent but not as high as some of the other solvents. Staff researched multiple mineral spirits MSDS documents that revealed a 31 g/L spread in the material VOC (759 g/L to 790 g/L).

Flammability – Mineral spirits has a NFPA rating of 2 for flammability indicating that it is a moderately flammable solvent.

Toxicology – Mineral spirits has a NFPA rating of 1 for health rating indicating that it has a slight health risk. The vapors from mineral spirits can irritate the eyes, nose, throat, skin, and in larger doses can cause chemical pneumonitis.

Paint Thinners

Paint Thinners are similar to low odor mineral spirits and are manufactured from petroleum distillates. The primary purpose is to thin oil based paints however, paint thinners can be used effectively for degreasing tools and general household cleaning.

As a VOC – Paint thinner is a high-VOC containing solvent. Staff researched multiple paint thinner MSDS documents that revealed a 107 g/L spread in the material VOC (775 g/L to 882 g/L).

Flammability – Paint thinner has a NFPA rating of 3 for flammability indicating that it is a highly flammable thinner.

Toxicology – Paint thinner has a NFPA rating of 2 for health which indicates that it has a moderate health risk. The vapors from paint thinner can irritate the eyes, nose, and throat and can cause headaches and dizziness.

Toluene

Toluene is a colorless liquid and has a sweet, pungent, benzene like odor. It is used as a common solvent for its ability to dissolve paint, rubber, printing inks, adhesives, lacquers and sealants.

As a VOC – Toluene is a high-VOC containing solvent. Staff researched multiple toluene MSDS documents that revealed a material VOC of 863 g/L.

Flammability – Toluene has a NFPA rating of 3 for flammability indicating that it is a highly flammable solvent.

Toxicology – Toluene has a NFPA rating of 2 for health which indicates that it has a moderate health risk. The vapors from Toluene can be intoxicating but in large doses it can cause extreme fatigue, mental confusion, nausea, headache and dizziness. Since toluene has low water solubility it cannot exit the body through normal routes such as sweat, urine, or feces.

Turpentine

Turpentine is bio-based solvent that is used as a thinning solvent for oil-based paints and is manufactured by obtaining the tap sap of pines trees and then distilling it into a fluid.

As a VOC – Turpentine is a high-VOC containing solvent. Staff researched multiple turpentine MSDS documents that revealed a material VOC of 863 g/L.

Flammability – Turpentine has a NFPA rating of 3 for flammability indicating that it is a highly flammable solvent.

Toxicology – Turpentine has a NFPA rating of 1 for health which indicates that it has a slight health risk. The vapors from turpentine can burn the skin, eyes, and cause damage to both the respiratory and central nervous systems.

VM&P Naphtha

Naphtha is a petroleum-based chemical and is also known as petroleum ether. It is

manufactured by distilling petroleum or coal tar and is commonly used as a cleaning solvent. The VM & P means “Varnish Makers and Printers”.

As a VOC – Naphtha is a high-VOC containing solvent. Staff researched multiple naphtha MSDS documents that revealed 125 g/L spread in the material VOC (750 g/L to 875 g/L).

Flammability – Naphtha has a NFPA rating of 3 for flammability indicating that it is a highly flammable solvent.

Toxicology – Naphtha has a NFPA rating of 2 for health indicating that it has a moderate health risk. Short term exposures to high levels of naphtha can cause headaches, dizziness, confusion, lack of muscle coordination, and sense of balance. Other symptoms can also include irritation of the skin, nose, eyes, throat, and stomach discomfort but at higher levels naphtha can cause unconsciousness which could result in death.

Xylene

Xylene is a colorless, sweet-smelling liquid that is produced from petroleum. The term xylene, also known as xylol, refers to a mixture of three benzene derivatives (isomers) that can be differentiated by their forms, *meta*-xylene (m-xylene), *ortho*-xylene (o-xylene), and *para*-xylene (p-xylene), as a solvent.

As a VOC – Xylene is a high-VOC containing solvent. Staff researched multiple MSDS documents that revealed a 12 g/L spread in the material VOC (860 g/L to 872 g/L).

Flammability – Xylene has a NFPA rating of 3 for flammability indicating that it is a highly flammable solvent.

Toxicology – Xylene has a NFPA rating of 2 for health indicating that it has a moderate health risk. Short term exposures to high levels of xylene can cause headaches, dizziness, confusion, and lack of muscle coordination and sense of balance. Other symptoms can also include irritation of the skin, nose, eyes, throat, and stomach discomfort but at higher levels xylene can cause unconsciousness which could then lead to death.

APPENDIX B

COMPLIANT TECHNOLOGY CURRENTLY AVAILABLE

COMPLIANT TECHNOLOGY CURRENTLY AVAILABLE

1st ENVIRO SAFETY, INC.

- ORGANIC CLEANER/DEGREASER, MILITARY STRENGTH,

Ace Coating Company

- Enviro-Power Grease & Tar Remover
- Enviro-Power Industrial Cleaner

AG Environmental

- Soy Gold 1000
- Soy Clear 1500

Ax-It, ST Cleaner

- Jet Wash 12
- Jet Wash 14

Bortz Distributing Company

- Lacquer Thinner, LVLT01

Buckeye International Inc.

- Shop Master RTW (Using RTU Ready -to-use)

Carboline Company

- Thinner 225 E
- Thinner 236 E
- Thinner 242 E
- Thinner 243 E

Castrol Industrial Inc.

- Come-Clean 900
- Techniclean 2000

Chem Free Corp.

- SW-1 Activating Degreasing Solution
- SW-6 Select Metals Degreasing Solution
- SW-6LF
- SW-7 Parts/Brake Cleaning Solution
- SW-8 Aircraft/Weapons Cleaner

Chemco Products Co.

- Chemstar Super Clean

Chemex Industries

- Zero VOC Solvent Degreaser

Church & Dwight Co., Inc.

- Aquaworks MPC

Colloid Cleaners

- Power Pack, 2000

CRC Industries, Inc.

- CRC Smart Washer Auto & Ink Grade Cleaning Solution, 14156
- CRC Smart Washer Industrial Grade Cleaning Solution, 14148

Deft Finishes

- VOC Exempt Reducer IS-256
- VOC Exempt Reducer IS-276

Diana Industries International, Inc.

- Heavy Duty Degreaser Concentrate, 07214

Domino Amjet Inc.

- BK Make-up, MC-890
- Wash, RG-0029
- Wash, WL-880
- Wash, WL-890

Dow Corning Corp

- Dow Corning 244
- Dow Corning 344
- Dow Corning OS-10
- Dow Corning OS-2
- Dow Corning OS-20
- Dow Corning OS-30

Dura-Chem Inc.

- AQUA SOLVE 1-M, 1-M
- MULTICLEAN NG-2-M & BOOSTER ML, NG-2-M
- ULTRA CLEAN L.P.H.
- ULTRA CLEAN S.P., S.P.

Earth Alive Resources, Inc.

- Bosun's Choice - All-in-one Marine Cleaning Solution
- EARTH ALIVE PARTS WASHING SOLUTION
- Max Kleen - Heavy duty all-in-one cleaning & degreasing solution
- Rapid All - All-in-one janitorial & sanitation cleaning solution

EcoLink, Inc.

- OCC
- Pinnacle
- S-34 NG

Ellis Paint Company

- Acetone, 70
- Co-solvent Low-VOC, 78
- PCL 2040
- PCL-2071B
- Zero VOC Exempt Solvent, 80/20

Enviro Safe Technologies, Inc.

- E-190

Florida Chemical Co., Inc.

- Citrus Burst 100
- Citrus Burst Blend 1
- Citrus Burst Blend 8

Force Dry Cleaning

- COLD PLUS CLEANER

Gemtek Products

- SC-1000
- SC-Sol-Ex

Global Specialty Products

- Nature's Guard Soy-based Carbon Remover & Degreaser
- NZD-ULTRA Degreaser
- Optima-100GP Aqueous Degreaser
- Reman Aqueous Degreaser

Imperial Western Products

- Enforce Mold Release E-44
- Enforce Mold Release E-46
- Soy MeE-12

Inland Technology

- EP 921

Integra Environmental, Ltd

- Natures' Way PC Parts Cleaner, PC140
- NW WEAPON CLEANER,

IPAX

- Green Unikleen, 1223

Johnson Diversey

- SURE SAFE 405
- SURE SAFE 430

Kafko International

- Oil Eater

Kelleher Equipment Supply, Inc.

- COLD PLUS CLEANER
- NATURE'S CHOICE

Kleen Tec, Inc.

- KT 685, KT685C

Kyzen Corp.

- METALNOX M6314, M6314

Magnaflux

- DARACLEAN 200, 200

Mamco Intl. Corp.

- Bio-T Max, ---

Master Chemical

- Trim Clean F2
- Trim Clean 2020

Metalube Corp.

- AMC-511-4U CLEANER,
- MC-509/4U Cleaner, MC-509
- SC-510/4U CLEANER,

MiraChem

- Commercial Parts Washer Fluid M-500
- Mirachem 250 Rust & Scale Remover
- MiraChem 500
- Mirachem 500 (Diluted 2:1)
- MiraChem 750
- Mirachem 750 Low Foam (Diluted 2:1)
- MiraClean 250
- MiraClean 500
- MiraClean 750

M.L. Campbell

- Medium Reducer VOC Exempt, VC 1681
- Slow Retarder VOC Exempt, VC 1671

Orison Marketing, L.L.C.

- Evapo-Rust
- VPW SC-1000

Pacific Coast Lacquer

- Acetone, 2010
- Compliant Cleaning Solvent - SCAQMD Certified, 4040
- Compliant Cleaning Solvent, 8007
- Compliant Repair & Maintenance Cleaner, 2077
- Compliant Surface Cleaner, 1071
- Compliant Surface Cleaner, 2571
- Compliant Waterborne Cleaning Solution, 1720B
- Medium Universal Exempt Reducer, 8050
- NOVOC Compliant Universal Solvent - SCAQMD Certified, 2040
- Slow Universal Exempt Reducer, 8075

PCI of America

- Delta Green

- Hurrisafe 9065 Cast Iron Degreaser with Rust Inhibitor
- Hurrisafe 9100
- Hurrisafe 9450 Parts Washer Degreaser

Petroferm

- CleanSafe 7445
- CleanSafe 7448

PPG

- Acetone CP, Q30

PSC

- SOYGOLD , SG 2500

Ramco Specialty Products Inc.

- NC-300 Industrial Cleaner & Degreaser, 1114
- Pac-ATTACK CS-1 - Microbial Cleaner, 19974
- Pac-ATTACK CS-2 - Microbial Cleaner, 19975
- Pac-ATTACK Soil - Microbial Cleaner, 1996
- Pac-ATTACK Surface - Microbial Cleaner, 1998
- Pac-ATTACK Trap - Microbial Cleaner, 1999
- Soylent Gold Cleaner & Degreaser, 7075
- Soylent Gold Parts Washing Solution, 7076

Red Devil, Incorporated

- SAV-A-BRUSH Brush Remover

Rust-Oleum

- 2400 Thinner, 2400402
- VOC Compliant Thinner, 9903986

Service Line, Inc.

- Renegade Parts Washer Detergent

Shepard Brothers Inc.

- QSOL, 220

Solutions-Plus

- Scrub-Away

Soy Technologies, LLC

- SoyFast Concentrate
- SoyGreen Graffiti Remover
- SoyGreen Solvent, SG1000
- SoyGreen Solvent, SG5000
- SoyGreen Solvent, SG6000
- SoyGreen Stainless Steel Cleaner

Spray Nine Corp.

- Low Emulsifying Wash, 37805

State Industrial Products

- New ERA

Summit Industrial Products

- Sur-Clean

Sunnyside Corporation

- Green Envy Paint Thinner, 730

Supreme Chemical of GA, Inc.

- KRUD KUTTER Adhesive Remover
- KRUD KUTTER Brush-Wash
- KRUD KUTTER Gloss-Off Prepaint Surface Preparation
- KRUD KUTTER Paint & Stain Remover
- KRUD KUTTER Prepaint Cleaner/TSP Substitute
- KRUD KUTTER Wallpaper and Paste Remover
- Original KRUD KUTTER

System One Technologies

- QSOL 200 Cleaner
- QSOL 220 Cleaner
- QSOL 300 Cleaner

Tiodize Co., Inc.

- D99 Cleaner/Degreaser, D-99

TMT Services Corp.

- Grease Master, R-300

Zinex Corp.

- Viro Clean

Zymo International, Inc.

- Surfzyme HD
- Surfzyme HD Concentrate (Low Foam) New, 50000
- Surfzyme HD Concentrate (Rust Inhibitor) Old, 50055

APPENDIX C

TDS & MSDS REFERENCES

TDS & MSDS SHEET REFERENCES

High-VOC Products (> 25 g/L of material VOC)

Bortz Products, MSDS for Acetone, Denatured Alcohol, Lacquer Thinners, Methyl Ethyl Ketone, Paint Thinners,

http://www.brenntagpacific.com/en/pages/Products/Complete_Product_List/index.html

Citco Petroleum, MSDS for Mineral Spirits,

http://seahawkpaints.com/Pdf/MSDS/Solvents/MSDS_MineralSpirits.pdf

Citco Petroleum, MSDS for Toluene,

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Citco Petroleum, MSDS for Xylene,

http://seahawkpaints.com/Pdf/MSDS/Solvents/MSDS_Xylene.pdf

Cloverdale Paint, MSDS for Clova Thinner #17: Lacquer Thinner,

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http://cloverdalepaint.com/info/html_msd/C-25.htm

Cloverdale Paint, MSDS for Clova Thinner #9: Xylene/Naphtha,

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